A.I.D. Technical Report No. 16
(Document Order No. PN-AAX-276)

Export Promotion and Investment in India

by

James Fox
U.S. Agency for International Development

Carlos Pelay
U.S. Agency for International Development

Hans-Peter Brunner
Development Economics Group of Louis Berger International, Inc.

Assessment Manager
Cressida McKean
U.S. Agency for International Development

Agency for International Development
Center for Development Information and Evaluation

November 1993

TABLE OF CONTENTS

FOREWORD

Recent economic literature strongly suggests that outward-oriented economies with sound trade, investment, and export systems have achieved better development results than inward-oriented economies.

The Agency for International Development (A.I.D.) has devoted substantial resources to supporting outward-oriented growth through projects focused on export and investment promotion. Key questions facing donors are the following: Is export and investment promotion assistance worthwhile? Does it merit continued A.I.D. support?

This study of India is part of a worldwide assessment of A.I.D.'s experience with export and investment promotion services. The purpose of the assessment is to evaluate the contribution of intermediaries providing services to exporters in developing countries. The services examined are provided directly to exporters or investors and include information (e.g., about foreign markets), contact making (e.g., with buyers), deal making, technical assistance, and government facilitation. Issues analyzed include the rationale for donor intervention; the impact on exports, jobs, and the market for support services; the return on A.I.D.'s investment; service strategies; and effective service providers. The analysis is based on surveys of exporters in seven countries, extensive interviews with service providers, and other sources.

In conducting the assessment, the Center for Development Information and Evaluation (CDIE) focused initially on export and investment promotion projects in the Latin America and the Caribbean (LAC) region. A desk review examining 15 projects resulted in the report, Promoting Trade and Investment in Constrained Environments: A.I.D. Experience in Latin America and the Caribbean. CDIE followed up with field visits to Guatemala, the Dominican Republic, Costa Rica, and Chile, culminating in the synthesis report, Export and Investment Promotion: Sustainability and Effective Service Delivery. In 1991, CDIE initiated fieldwork in Asia, examining programs in India, Indonesia, Korea, and Thailand.

This Technical Report of Export Promotion and Investment in India is one of four country reports produced for the Asia phase of the assessment. To complement the country reports, CDIE completed two cross-cutting technical reports, Service Use and Impact: Evidence From a Survey of Exporters in Asia, and, Measuring Costs and Benefits of Export Promotion Projects: Findings from the A.I.D. Experience. CDIE also carried out a desk review of similar projects in the Near East region, which is reported in "A Review of A.I.D. Experience: Export and Investment Promotion in Egypt and Morocco" (forthcoming). Appendix B contains a list of the papers prepared for the overall export promotion study. The individual technical reports do not draw management implications for A.I.D.; instead,

they provide the specificity and country detail that are the basis for drawing management implications in the program assessment report.

The program assessment report "Export and Investment Promotion Services: Do They Make A Difference?" draws on each of these technical reports to present key findings, conclusions, and management implications of the assessment.

SUMMARY

The results of this case study confirm that India's policy regime is highly antiexport, making it extremely difficult for Indian firms to compete in world markets. The study also confirms that substantial entrepreneurial resources are ready to take advantage of any opening the Indian Government provides. Indeed, even the slight opening of the economy to computer and electronics exports is causing dramatic growth in Indian business competence and exports in those sectors. Across a wide range of sectors, it appears that efficient, world-competitive production is actively prevented by government policy.

Although not intended to promote exports, the Program for the Advancement of Commercial Technology (PACT) project, undertaken by USAID/India, was highly successful in linking Indian firms with appropriate U.S. partners for commercially viable projects. More broadly, the project helped promote the creation of a venture capital industry in India and reinforced the competence of Indian entrepreneurs.

This report delineates the following five main findings:

Projects can have significant policy fallout when they demonstrate the benefits of better policy and illuminate directions in which policy should move, as PACT did for indigenous research and development in India and for linkages to foreign firms.

The findings of Keesing and othersþthat government export promotion activities are of limited or marginal valueþis strongly confirmed (Keesing and Singer 1992). It is possible to spend, as India does, large amounts of resources without significant impact.

At least in the Indian context, firms appear to misperceive the risks and rewards of exporting. Firms in a protected environment are

insufficiently aware of the potential for sharp increases in productivity from better technology and methods and of the increased profits that can be generated by such increases.

High payoffs come from close collaboration between foreign and domestic firms in a repressed economy like India's. The rewards of collaboration come gradually as continual contact moves the firms step by step toward methods, technology, and products that are competitive in world markets.

U.S. assistance to India should focus on the fundamental and overriding economic problem of the massive waste of the country's scarce investment resources. India's capacity to save would allow annual growth of 9 to 10 percent per year. The challenge for the Agency for International Development is to identify paths of economic liberalization, particularly trade liberalization, that will help improve efficiency.

GLOSSARY

A.I.D. Agency for International Development

CDIE Center for Development Information and Evaluation, Central Evaluation Office of A.I.D.

EPZ Export Processing Zone

GDP gross domestic product

IBRD International Bank for Reconstruction and Development

ICICI Industrial Credit and Investment Corporation of India

LAC Latin America and the Caribbean

OECD Organization for Economic Cooperation and Development

PACT Program for the Advancement of Commercial Technology Project

R&D research and development

RBI Reserve Bank of India

TDICI Technology Development Investment Company of India

USAID/
India A.I.D. Mission in India

1. STATEMENT OF THE PROBLEM

The experience of developing countries over the past several decades suggests a strong positive link between outward orientation of trade policy, or export success, and overall economic growth. While most academic economists accept this association, they are divided on the question of where causality lies and particularly on the following policy questions:

> Is export success simply a matter of appropriate macroeconomic policy or can export promotion speed the process?
>
> If export promotion is a useful tool, what types of interventions are most appropriate, and what is the economic rationale for such interventions?

Although researchers have not provided conclusive answers to these questions, the Agency for International Development (A.I.D.) has been engaged in a variety of activities, particularly over the past decade, to promote exports from developing countries. A.I.D.'s interest in this area is not new; export promotion was a central focus of the Agency's assistance in Korea and Taiwan in the 1960s and of significant activity in some Latin American countries. This focus disappeared for about a decade during the 1970s.

A.I.D.'s general approach to export promotion has focused almost entirely on providing services to exporters, rather than subsidies or other forms of direct support. The implicit model confirms that there is a failure in the market for support servicesþfor example, information on foreign markets, sources and value of technical assistance, and knowledge of export-related investment opportunitiesþthat prevents firms from undertaking profitable activities.

This study is part of a larger effort to draw on the experience of A.I.D. activities of the 1980s in export promotion to answer the questions listed above. The first phase of the effort involved a study of export promotion projects in Latin America that were judged successful. The study used interviews with exporters and foreign investors in export industries to

learn what kinds of promotional services were most productive and highly regarded.

The current phase of the larger effort includes country work in three Asian countriesþIndia, Indonesia, and Thailandþwhere A.I.D. has carried out projects to promote exports. India was chosen in part because the specific project being studiedþthe Program for the Advancement of Commercial Technology (PACT)þwas considered successful, even though most observers thought that the Indian policy climate was strongly biased against exports. Thus, the Indian study is intended to shed light on the issue of whether some interventions can be successful in poor policy environments, as well as to address the two previous questions.

2. THE ECONOMIC CONTEXT

Export Performance

In the early 1950s, India was the largest exporter in the developing world. Both its exports and its industrial production were highly diversified by developing country standards. India had begun industrializing earlier than most developing countries (the first Indian steel mill was built in 1912, and steel production in 1950 was 1.5 million tonsþnot far behind Japan and greater than Australia, Sweden, and all other developing countries at the time). In 1914, India had "the world's fourth largest cotton textile industry and the second largest jute manufacturing industry" (Lal 1988, 19). Per capita electricity production in the early 1950s exceeded that of Korea and Thailand, and total electricity production was vastly larger than that of any other developing country.

India's head start gradually disappeared, and currently India is far down the list of developing country exporters. For most of the last decades, Indian exports simply did not grow. As Figure 1 shows, exports in constant prices were virtually stagnant between 1950 and 1971. Exports then doubled over the next 5 years and virtually stagnated from 1976 until 1985. Between 1985 and 1990, a second growth spurt again doubled exports in 5 years.

The trends in Indian export performance are curious because world exports simply do not conform to this pattern. World trade grew steadily and rapidly from 1950 to 1980, declined sharply from 1981 to 1983, then steadily grew again after 1983. The explanation

for the pattern of Indian export trends surely lies primarily in policies followed by the Indian Government. The poor fit between trends in Indian exports and those of the rest of the world makes external causes for India's anomalous export trends unlikely.

Manufactured exports from India have been growing faster than total exports, rising from about 25 percent of the total in 1950 to 65 percent by the late 1980s. The trend in manufactured exports follows that of total exports, although with a more significant positive tilt. Nevertheless, growth in manufactured exports in India has been far less dynamic than in some of India's Asian neighbors and significantly slower than in developing countries in other regions.

By the late 1980s, Indian exports of manufactures were a small fraction of the Asian total. India, quite simply, was left behind. Other countries had taken advantage of opportunities in the world market that India had ignored and now find themselves linked much more closely to world markets, producing higher quality and higher technology goods. These other countries are more favored as locations for international investment and, with more developed physical and organizational infrastructure, for continued growth in exports.

The Policy Context and Export-Led Growth

Economic Policy

It is a truism among economists that autarky is much more harmful in small countries than in large ones. Domestic competition is likely to be greater in a large country because the market is larger. More firms of economic scale in any particular industry can coexist, which is conducive to more efficient production even in the absence of the spur of international competition.

Since independence, India has adopted a strongly inward-oriented development strategy. Government quantitative controls on imports and on the use of foreign exchange effectively put the determination of types and quantities of imports in the hands of government planners rather than the marketplace. At the same time, planning was also used extensively for domestic resource allocation. Among democratic countries, India was the closest imitator of the Soviet planning model, with a succession of Five-Year Plans beginning in 1951.

From the time of India's second Five-Year Plan (1956-1961), central elements of the approach focused

on government control of private investment and foreign exchange. Each Five-Year Plan provided the aggregate projections of required levels of output by sector. These projections were then used in an input-output framework to generate required levels of investment in each sector. Based on this model, firms were granted permission to make capital investment. Without prior Government approval, capital investment was not permitted. The rationale for this approach was that capital was extremely scarce in India, making it essential to prevent its duplication or waste.

In practice, Indian investment programming proved extremely wasteful of capital. Historically, India's incremental capital-output ratio has generally exceeded that of other developing countries and has tended to rise over time. One estimate shows the ratio rising from below 5 during the late 1950s to more than 6 from 1965 to 1982, declining back to 5 in the mid-1980s (Asian Development Bank 1990, 138). It has taken nearly twice as much capital to produce a given increase in output in India as in many developing countries.

Other statistics suggest that industry is highly capital intensive, plagued by substantial excess capacityþa curious phenomenon for a country where explicit government policy aims to control investment to prevent creation of excess capacity. An index for 30 industries shows capacity utilization of 75 percent in the early 1970s, falling rather steadily to 66 percent in 1984 (World Bank 1990, Vol. II, Table 8.4).

A recent World Bank evaluation of its more than $1 billion in loans to the Industrial Credit and Investment Corporation of India (ICICI), the largest quasi-private source of investment lending in India, found that although economic returns to its most recent loans were satisfactory, the incremental employment resulting from them was extremely small. An average of $45,000 in capital investment per job that was created resulted from the last two World Bank loans to ICICI. Given that the overall average capital per worker must surely be less than $3,000, such a figure suggests massive misallocation of investment resources in the industrial sector.

India has maintained high and growing levels of investment (Figure 2). By developing country standards, the current national savings rate is quite high at 20 percent, and the investment/gross domestic product (GDP) ratio has risen from 12 percent in the 1960s to 18 percent in the 1970s to 24 percent in the late 1980s.

In essence, the major factor in the relatively

slow growth of Indian GDP has always been the inefficiency of investment rather than its level. Cutting the capital-output ratio in half to bring it to levels similar to those of the Asian tigers (Hong Kong, Singapore, South Korea, and Taiwan) would mean that current investment levels would support an annual GDP growth of 9 to 10 percent. In another way, Indian economic growth has reflected only the growth of inputs (labor and capital) without increases in the productivity with which these inputs are used. Ahluwalia (1985, 132-35) calculates total factor productivity growth for India between 1960 and 1980 at somewhere between -0.2 percent and -1.3 percent per year.

Thus, the major policy challenge facing India is productivity. Only if the effectiveness of India's resource use can be dramatically increased can acceptable rates of growth of economic welfare be achieved.

Trade Policy

India has been one of the most closed economies in the world for the past several decades. Exports represented an average of 5.5 percent of GDP during the 1980s, reflecting some increase from a low of 3.9 percent during the 1960s, but below the share in 1950 (Figure 3).

After several decades of rigid controls, Indian trade policy was gradually liberalized in the 1980s. Some goods were moved from the prohibited list to licensing; others were removed from the requirement for licenses. Nevertheless, the process was slow and tentative. By 1991, the country still had (1) average tariff levels exceeding 100 percent, (2) most imports subject to government licensing approval, (3) significant numbers of goods for which imports were prohibited, and (4) foreign exchange control procedures that limited access to imports even where trade controls themselves were not binding. In sum, the liberalization process was still limited, and India remained at the time of this study one of the most closed economies in the world.

The Government devalued the rupee sharply during the first half of 1991, increasing the real effective exchange rate by 20 to 25 percent. In late July 1991, the Government announced further liberalization steps, including a reduction in the maximum tariff to 150 percent, automatic access to foreign exchange by exporters, sharp reductions in the import licensing regime, and an increase to 51 percent in the share of Indian companies foreigners are permitted to own. The rupee will become a convertible currency, at least for

trade purposes, within 3 years. That such reforms were considered almost revolutionary by the Indian media is a sign of the severity of the distortions present in the country's economy. Nevertheless, the reforms appear to represent a new consensus on the direction of economic policy, although it may take several years to achieve substantial progress.

The reasons for the liberalization of policy in the 1990s cannot be identified precisely. Fairly conclusive economic studies demonstrating the high value of trade liberalization have been around for about two decades and the success of the Asian tigers has been evident for at least a decade. The collapse of the Soviet Union probably had a significant effect, since India had historically imitated some aspects of Soviet planning and had been the Soviet Union's first or second largest trading partner in recent years.

Nevertheless, noneconomic objectives may have played a role in convincing policymakers to move in a direction to pressure for broad liberalization of trade and industrial policy. The better policy may have resulted from what psy- chologists call salience, a concept recently introduced into the economic literature (Akerlof 1991). Psychologists have shown that salient experience (i.e., personal or visual experience) affects people's views much more powerfully than analytical arguments or logical conclusions.

Using this line of argument, one can argue that the PACT project played a crucial role in convincing policymakers to adopt more outward-oriented economic policies. The PACT project was initially heralded by some as emblematic of the new strategy for technological development, initially achieving some political visibility (Echeverri-Gent 1990). PACT and other technological policy liberalization undertaken about the same time helped move some Indian high-technology sectors, particularly parts of the computer industry, from a position of significant lag to one close to the technology frontier. The visible demonstration under the PACT project that tangible technological benefits were flowing from close collaboration with foreign firms thus may have increased political-level understanding of the need for economic liberalization in a way that economists' arguments over the past three decades had not. A group of Indian technocrats certainly pursued this approach to reform. {Footnote 1} There is virtually no way to test this hypothesis, so whether salience produced better policy must remain a matter of speculation.

The Private Sector and Constraints to Export-Led Growth

With its large internal market and long period of industrial development, India has a vibrant private sector. The largest private industrial firms are significant by world standards. The largest private industrial firm (Tata Iron and Steel) had 1990 sales of $1.1 billion, and 11 other private firms had 1990 sales in excess of $400 million. Sixty-three private firms had sales exceeding $100 million. The private sector coexists with a large parastatal sector, which accounts for 25 percent of industrial employment and a considerably larger share of the industrial capital stock. If Government-owned enterprises were included in these figures, the number of large firms would probably double. Government ownership is most concentrated in basic industry (the "commanding heights," such as steel, heavy equipment, and electricity) but extends throughout the range of industries.

In addition to the pervasive role of public sector firms, a variety of other restrictions on industrial firms exists. These include controls on capacity, reservation of specific industries to small-scale production, a limit to 40 percent (changed in July 1991 to 51 percent) on foreign ownership, and restrictions on imports of a wide variety of foreign machinery and technology. Where imports are permitted, it is generally on the basis of specific case-by-case approvals.

Capacity controls have been crucial to the evolution of the sector. Each firm was ensured freedom from new competitors as long as excess capacity existed in the sector, because such unused capacity constituted a prima facie case to the planners not to approve any new investments. Consequently, each firm had an interest in restricting demand through high prices to maintain excess capacity. This may have constituted one obstacle to exports. Often, unused capacity may be used initially as an incentive for firms to seek export markets where they would be willing to sell at lower than fully allocated cost. In the Indian context, using exports to reach full capacity carried the risk that the Government would approve competitors' investment applications, thereby reducing the firm's profits on its domestic production.

A range of other controls limits the flexibility of firms to participate in exporting. The following two controls are of particular note: foreign exchange controls and import controls.

Foreign exchange controls appear to be the most limiting. Indian firms are required to surrender all export proceeds to the central bank (Reserve Bank of India [RBI]), which has extensive procedural controls

over all aspects of foreign exchange. Firms require RBI approval to make sales trips abroad, to reimburse foreign buyers for damaged goods, to receive foreign commissions exceeding 6 percent, to conduct foreign consulting or market research assistance, and to conduct almost any other activity involving expenditure of foreign exchange. Firms complain that 6 months is often required for RBI approval of such expenditures. Firms have argued that such time lags strongly discourage exporters in any but routine and well-established markets, making it impossible for them to compete in dynamic or emerging export sectors. Several firm representatives interviewed stated that it is simply not possible for Indian firms to service their foreign buyers adequately while complying with RBI regulations.

Import controls also play a key role in limiting export competitiveness. Imports of machinery or intermediate goods for export also require government approval, which may take months for each transaction. Computer firms have argued that the lag of several months between submission and approval of a request for imported materials to go into export products effectively prohibits such exports. The rapid change in technology, they say, means that any computer product not deliverable within 2 months simply will not be ordered.

Numerous firms surveyed during the assessment gave microlevel support for a pernicious role of import controls on exports. Several firms stated that lack of access to imported inputs made their exports noncompetitive for reasons of quality. Firms argued that lack of standard international qualities of some products (paper, glass, some textiles, specialty steels) were the major obstacle to substantial exports of certain products.

3. THE MARKET FOR EXPORT AND INVESTMENT SERVICES

A.I.D.'s Approach in Promoting Exports

A.I.D.'s Role in India

A.I.D. is a marginal donor in India, accounting for less than 1 percent of all donor assistance. Consequently, its potential for affecting government policy is extremely limited. The Mission's approach has been to select narrow sectors where it believes significant payoffs exist. Although A.I.D. did not directly target exports in its India strategy, the Agency has undertaken the PACT project, which has had a significant indirect export impact.

The PACT project diagnosed a lack of linkage between India's substantial research capabilities and intellectual capital on the one hand and commercial technology on the other. A.I.D. proposed a new mechanism to promote closer links between industry and research. The modality was conditional grants (repayable as royalties if the product was commercialized) in support of joint research and development projects by Indian and U.S. firms. The $15 million project, approved in 1985, provided up to $500,000 for individual subprojects, to be matched by the joint-venture partners. About 30 subprojects had been approved at the time of the review, of which 11 were primarily for exports. All 11 firms were interviewed.

Rationale for the PACT Project

The PACT Project Paper (USAID/India 1985) provides a rationale for the project based on underutilized skilled human resources and inadequate linkages between academic research and industrial production. From an economic perspective, the argument is that firmsþboth manufacturing and financial intermediariesþmisperceive the opportunities for profits from more research and development (R&D). There is a failure to inform the market. The PACT designers expected the project to demonstrate the feasibility of such R&D, which would stimulate manufacturing firms to undertake further research, particularly joint research with foreign firms, and create an active private market for R&D financing.

The export of products developed under the PACT project is not considered in the Project Paper; nevertheless, an export rationale for PACT could easily be developed. India is clearly a foreign-exchange constrained economy in which the shadow price of foreign exchange is higher than the price set by the Government. {Footnote 2} The social value of export earnings is higher than the private returns to the firm; thus, some level of subsidy is socially desirable.

Since the rationale for the PACT project is quite distinct from the export services focus of this assessment, it is improper to consider this assessment as an evaluation of the project. In general, PACT is studied for its value in promoting exports, although this was not an explicit goal of the project. Nevertheless, PACT's role in stimulating the venture capital industry is a project goal relevant to this assessment.

Service Use and Impact: The Client Perspective

Exporting firms were asked several questions concerning the kinds of services received, from whom services were received, and how valuable they were in supporting firms' efforts to export.

Services used. Table 1 summarizes the responses of firms to questions concerning the services they received and the importance of those services. Foreign market information, technical assistance in production, buyer contacts, and trade shows were used by more than half of the surveyed firms. For each, at least a quarter of the firms felt the service had a material impact on the firms' export success. With a few exceptions (directories, sample preparation) the most widely used services also tended to be the most valued.

Sources of services. Table 2 shows the sources of services that firms considered had an impact on their export success. Since sources of the valued service in some cases were other divisions of the same firm, those responses were eliminated from the table, which includes only sources external to the firm. As shown in the table, the bulk of valued services came from business dealingsþ44 percent from foreign partners of the Indian firms and another 19 percent from suppliers or buyers. External-donor or government sources and the Indian Government each provided another 15 percent of valued services. The remaining 7 percent came from other private sources, either for pay (e.g., consulting firms) or not for pay (e.g., chambers of commerce). The importance of different sources varied with the type of service. The Government of India was seen as important in the areas of trade shows, for which 75 percent of firms using the service found it helpful, and in gaining government approvals, for which 50 percent of firms found some agency of the Government helpful. It should be noted, however, that these shares refer only to firms that used a service and found it important. For these two services, only 10 percent of all firms surveyed did so.

Credit for export success. In addition to the questions asked of firms about sources and the importance of the variety of services for exporters previously described, each firm was also asked to distribute the credit for its export success between its efforts and those of other institutions. Overall, firms attributed 43 percent of their success to internal efforts and 57 percent to others. Considering only external help, Table 3 shows the results of this query. These responses parallel those of the direct inquiries on particular services except for the share given to the private sectorþand mainly to chambers of commerce. One possible interpretation of this result

is that chambers of commerce were seen as having only a limited value to firms in any particular service area, but cumulatively were important to overall success.

The limited credit given to Indian Government agencies is striking. India has a plethora of governmental institutions, organizations, and procedures aimed at promoting exports. In fact, few developing countries have as many government-supported institutions established for promoting exports. These include export promotion councils (joint government/private organizations in each of nearly 40 export sectors), Indian Embassies abroad, the National Technical Standards Department, the Ministry of Commerce, the Trade Fairs Authority, the Trade Development Agency, and the Export-Import Bank. Most exporters received some services from one or more of these organizations. Most were required to belong to the appropriate export promotion council for which they were required to pay a contribution based on exports. In most cases, however, the assistance was of limited value to the firm. With the exception of the Export-Import Bank, these institutions were held in very low esteem by firms.

Other findings of the survey include the following:

1. India has several highly successful exporters and many other firms that expect dramatic expansion of exports in the next several years. These firms are mainly in high-technology sectors, such as computers, electronics, and biotechnology, where the Government has eliminated many of the barriers to international trade. Most export successes included extensive involvement with a foreign company or a consulting firm with specialized expertise, such as technical assistance, partnerships, market information, or production improvement. Success involved major changes in products or in attitudes (particularly on delivery schedules and quality control).

2. Many companies outside the dynamic sectors want to export but are profoundly ignorant of how to link with the international marketplace. They have been cut off from the international marketplace for so long that they are simply out of touch. In many cases, companies admitted that their products could not meet international quality standards; a situation was often attributed to poor quality inputs (glass, paper, glue, specialty steels, and textiles were mentioned). Government import restrictions that force companies to use such inferior inputs, they argued, do not allow them to meet international standards for finished goods.

3. Matchmaking with foreign firms was the most common desire of companies. Many firms had used Indian Embassies abroad to obtain lists of potential foreign buyers of Indian goods, generally producing no results. One consulting firm told us that any large U.S. company could expect to receive a letter a day from some Indian company seeking sales. Despite this interest, the team concluded that most Indian companies are simply not able to provide goods of required quality at world market prices. The binding constraint remains the firms' incapacity on the supply side, not lack of contact with foreign opportunities.

Export-oriented units (firms that export 100 percent of output and thereby acquire special access to imports) and Export Processing Zones (EPZs) suffer from excessive government regulation. All EPZs are apparently government owned and suffer from lack of user orientation typical of government-owned zones in other countries. In the one EPZ visited (the Santa Cruz Electronics EPZ, which included numerous computer companies and software exporters), firms said they were forced to pay high prices for data links to the government telephone parastatal, and were prevented from leasing their own links at international prices.

Service Use and Impact: Perspective of Service Providers

The team also interviewed providers of venture capital to Indian firms. This market is somewhat broader than that targeted by the PACT project. PACT aimed at venture finance of R&D expenditures. Venture capital providers typically fund startup firms or relatively new firms that wish to dramatically expand operations. While both types, particularly in higher technology sectors, typically require some product development, the product is usually closer to commercialization than the R&D projects funded by PACT. Indeed, it is an open question whether venture capital should fund startups in which several years of work are required before commercialization. ICICI officials reported that they believed such early funding of startups is dangerous for the firm because setbacks in the research could quickly lead to poor morale and departures of key employees who fear that the money will run out before the product emerges. The ICICI officials argued that any firm needs some products that provide current income for R&D to be a viable enterprise.

Five years after the establishment of PACT, there were nine venture capital firms in India. The team interviewed officials from each. Detailed findings in

this area are included in Pelay (1992, 14).

PACT and venture capital. The venture capital sector has blossomed since the creation of PACT, but PACT's role was indirect. Most people interviewed in other venture capital institutions were either unaware of or only vaguely familiar with PACT. They were quite aware of the Technology Development Investment Company of India (TDICI), a venture capital affiliate that ICICI established after several years of PACT implementation. From interviews, it appears that PACT demonstrated a demand for venture capital financing. Thus, PACT stimulated TDICI and TDICI became the model that influenced most other venture capital institutions.

The team rejected the idea of a "market failure" in venture capital financing. The financial sector is extremely sophisticated and willing to move into new areas, such as venture capital, when government policy permits it. ICICI is one of the best financial institutions in India in this regard. The venture capital sector was underdeveloped because of government restrictions. Subsequent to PACT's creation, government policy has moved in the proper direction. PACT probably played some role in this through stimulating the creation of TDICI and through ICICI's Chairman Vaghul, who sought to influence government policy. But numerous other people and institutions were also pushing policy in the proper direction at this time, and there is no way to separate out the strands that ultimately cause policy to evolve in a given direction.

PACT's role in promoting joint R&D. PACT firms placed a much higher value on joint R&D after participating than non-PACT firms, and the evidence suggests that the PACT experience was important to this. There has been little spread of this to the broader private sector. This is understandable because the first commercializations of PACT technologies began in mid-1991. If PACT has an impact on the information market, it will take a decade to show as firms spring from their PACT experience to other joint ventures and demonstrate great success in the marketplace.

As with the venture capital sector, the quicker payoff to PACT will have to be in "pushing back the policy envelope." The lack of joint venture activities in R&D, as in many other areas, is the result of government policy. Policy has moved in the proper direction, probably with some impetus from the promising activities under the project. But many other actors were also pushing in the same direction. Nevertheless, the PACT project was clearly pushing in the right direction at the right time.

4. EFFECTIVE INTERMEDIARIES FOR PROMOTING EXPORTS

Effectiveness of A.I.D.-Assisted Intermediaries

Impact on Assisted Firms

PACT was highly regarded by participants. However, in what form and to what extent the PACT project affected the firms' behavior was less clear. Interviewers asked each PACT company whether PACT funding was critical. The results were predictably mixed, with two unequivocally affirmative and two equally negative. Four companies said that R&D probably would have taken place, two that it probably would not have, and one that it would have taken place, but more slowly or less completely. PACT did not play a major matchmaking role: it found a foreign partner for only one firm; the other firms had developed their foreign linkages before PACT.

Despite PACT's limited impact on R&D decisions, firms were uniformly enthusiastic about the project for several reasons: the "seal of approval" that created a Hawthorne effect, the greater ease with which firms could obtain board of directors approval because of the Hawthorne effect or because of the prospect of grant funding, and the expectation of speedier government approval of investment or import requirements because of the official sanction. It is difficult to place a value on these factors. However, it may seem reasonable to attribute to the PACT project half of the investments made and to assume that half would have occurred without it.

PACT firms appeared to have increased their valuation of foreign participation in R&D as a result of PACT. For 9 of the 11 PACT firms, the project was their first joint R&D effort. Of the nine PACT firms that commented on the importance of foreign participation in R&D, six considered it crucial. Only oneþa pharmaceutical firm whose first joint R&D activity was in 1970þconsidered it unimportant. Paired firms (similar firms not receiving PACT assistance) were much less convinced on this point, with only one considering it crucial and four considering it unimportant. This suggests that lack of awareness of the value of foreign collaboration may be an impediment to productivity growth. In other words, experiencing joint R&D is important to discovering its importance.

Export Performance of A.I.D.-Assisted Firms

The A.I.D.-assisted firms for which data were available increased exports significantly faster than either unassisted firms or Indian firms generally. The nine PACT firms for which data were available increased their exports sevenfold over a 5-year period. The seven firms venturing a projection for the next 5 years expected an eightfold increase. These are dramatically higher than Indian exports generally, although they are also matched by some of the non-PACT firms in high-technology sectors. Because of the small sample of paired firms, the possibility of selection bias, and the unique circumstances of a number of PACT firms, one should not impute statistical significance to these differences.

Rate of Return on A.I.D.'s Investment

A rate-of-return analysis of A.I.D.'s investment in PACT is carried out in a separate paper (Nathan Associates and Louis Berger International 1992). One particularly successful subproject (a mushroom adaptation) appears to provide benefits large enough to yield a 12-percent rate of return on the costs of the entire PACT project. Most of the other subprojects are only now beginning to reach commercialization, and solid cost and projected return data are not yet available. Based on the interviews, a substantial majority of the subprojects were expected to be highly successful. Given these considerations, one would expect a high rate of return to A.I.D.'s investment once sufficient data become available.

Sustainability of the A.I.D.-Supported Intermediary

Two questions concerning the issue of sustainability should be considered. First, will re-flows from PACT grantees provide sufficient resources to maintain or enlarge the $15 million equivalent in PACT's capital base? Second, has the experience of the PACT grant provided ICICI with the tools to run such a fund with its own resources?

Reflows from the PACT grant. As with any innovative activity, the PACT grant posed numerous issues for the implementing agency. What specific legal arrangement should be made for repayment of the grant? How should the product of the research be defined? How large a royalty should be paid to ICICI by successful innovators and for what multiple of the original grant? Lacking experience with these issues, the project designers necessarily had to guess answers.

The PACT project was approved in 1985, the first subgrant was made in 1987, and the first reflows to

ICICI began in 1991. Although three or four of the projects were entering the commercial stage in 1991, the actual results from these activities are still subject to conjecture. Thus, there is no repayment experience on which to base a judgment of the project's sustainability. ICICI revised its projections of reflows in October 1991, postponing expected paybacks for several projects from the previous projection, which had shown moderate profitability for ICICI. The current projection does not estimate recovery of the original funding until 1994 to 1995, so that the financial return on the project is expected to be quite low. {Footnote 3} The export subprojects reviewed here appear to be more successful, at least in the near term, than those subprojects for domestic production. The export subprojects received 40 percent of the total funding but are expected to provide 74 percent of the reflows in 1991-1992 and 53 percent in 1992-1993.

The slow reflows to date may be due in part to startup problems. ICICI staff expressed a commitment to continue PACT activities after the termination of A.I.D. funding, and ICICI has already committed some of its own resources to those activities. With experience, the likelihood is that PACT's future repayment record will improve. The team observed the following three main types of learning by ICICI, all suggesting stronger future performance:

1. It appears that ICICI initially set the royalty and total repayment requirements for successful projects too low. The former was set at a maximum of 5 percent of sales and the latter at 200 percent of the original grant. These have since been revised to 8 percent and 250 percent.

2. ICICI's administrative procedures for evaluating and approving grants have been substantially streamlined. Initially, the time required for grant funds was 7 to 8 months from first inquiry for early grantees, but the two most recent recipients reported approval of their projects within 6 to 8 weeks.

3. ICICI appears to have learned better selection methods because of two factors. First, it has become more cautious about computer software firms that are "betting the company" on a new project. More important, less attention is paid to examining of the feasibility of the proposed R&D in detail, and more attention is paid to the capabilities and track records of grantees. Detailed examination of proposals was one cause of long delays in early project approvals. ICICI's assumptionþmuch appreciated by several granteesþis that entrepreneurs with demonstrated capabilities are the best judges and enforcers of project success. Requiring entrepreneurs to provide

half of the funding is considered sufficient for trusting the entrepreneurs' judgment.

In sum, the PACT project seems to have been a highly successful innovation, demonstrating the potential sustainability in the Indian context of conditional grant funding of R&D. Nevertheless, the replicability of the approach in other countries or institutions will depend on two imponderables. First, ICICI is clearly an extremely well-run institution that makes excellent use of its human resources. The evolution of ICICI's approach to subprojects clearly indicates ICICI's ability to learn from experience. ICICI is also quite decentralized and has a strong corporate culture.

Second, India may present a unique climate for joint R&D. The large numbers of highly trained scientists and engineers, combined with the previous isolation of the country from technological advances, probably create an extremely favorable environment for successful innovation. However, it is also possible that these advantages are offset, or more than offset, by the difficulties of operating in the constrained Indian environment.

Broader impacts of the PACT project. The PACT project appears to have had a materialþthough unquantifiableþimpact on the policy and institutional environment in India. The first such effect, on the venture capital market, is discussed elsewhere in this paper. The second is more speculative and relates to the Government's position on intellectual property, technology transfer, and foreign investment generally.

There are several strands to the circumstantial web of relationship. First, the PACT project acquired some visibility at the outset because of its close association with Prime Minister Rajiv Gandhi's new technology policy, announced in 1985. The discussion by Echeverri-Gent (1990), for example, demonstrates this kind of visibility. Second, the activity areas in which PACT was particularly effectiveþcomputer software and biotechnologyþare the sectors in which Indian R&D and export capabilities have been most successful. The PACT activities themselves were not likely to have had much direct impact, but they appear to have confirmed the expectations of ICICI Chairman Vaghul, who may have played a key role in influencing government policy in a more market-oriented direction. As discussed in Appendix A, the ability to "draw a picture" for policymakers with a salient and concrete example may be a powerful tool for reform.

Third, the trade liberalization process began in 1984 with the electronics industry and has gradually

spread to wider sectors of the economy. To the extent that the PACT grants demonstrated the positive results of liberalization, they can be seen as contributing to the perception that liberalization was working and should be extended to other sectors. There obviously is no satisfactory way to prove or refute these contentions. Government policy shifts seldom can be attributed to a single influence; in general, they come from a group of a committed individuals in leadership positions, who can build on emerging perceptions among politicians, the press, and other members of the informed public.

Effectiveness of Other Service Providers

The study did not include a broad inquiry of export-service providers other than in the venture capital market. Only two firmsþone consulting firm and one provider of international data base servicesþwere interviewed. Both companies complained of the difficulty of paying for foreign services. Exporters are not permitted to pay for such services in dollars without RBI approval, an apparently lengthy and uncertain process. Service providers have difficulty obtaining foreign exchange on their own as well, so providing an exporter with a service that requires dollar fundingþfor example, a market study in the United States or statistical data drawn from a foreign data baseþinvolves delay and difficulty.

Implications for Effective Service Delivery to Exporters

The interviews generally confirmed the view of Keesing and Singer (1992) that the policy environment is the critical factor in export growth, and that subsidized service provision is not itself a particularly effective means of compensating for that environment. Failures in the market for information are not a serious constraint to exporting by Indian firms. The serious failures are in the policy environment. Based on the team's observations, interventions that attempt to compensate for policy failures are likely to yield only modest results. There simply are too many obstacles for successful intervention. The PACT project did not attempt just to compensate for policy failure; it provided resources for some sectors in which policy was changing (computers and electronics) and probably reinforced the impact of the liberalization. It also pushed on the "policy envelope," creating pressure for further liberalization.

5. RATIONALE FOR INTERVENTION AS A MEANS OF INCREASING

EXPORTS

Rationale for Intervention

The conventional wisdom, with which the team agrees, is that India suffers from two main obstacles to faster economic growth: (1) excessive isolation from the world economy and (2) government controls that prevent internal competition and ensure that much of Indian production is inefficient at world prices. This means that factors of production are used inefficiently. The result of both is that India is producing well within its production frontierþproducing the wrong items inefficiently.

While import-substituting industrialization typically results in excessively capital-intensive production and monopoly profits for capital, the latter would not be able to operate in an economy as large as India's if domestic competition were not limited by the Government. Thus, the problem is less a matter of distortions of relative factor prices than misallocation or underutilization of each factor.

What are the misallocated factors of production? First, consider labor. India has abundant unskilled labor, which has a low marginal product. Much of the unskilled labor has inadequate capital with which to work, because capital within India is misallocated and concentrated in highly capital-intensive industries that produce for the domestic market. Unskilled labor is similarly prevented from being exported through labor-intensive products because other complimentary factors of production are not combined with labor, either because price distortions make this unprofitable or because government regulation prevents this from occurring.

Unskilled labor exhibits low productivity; but this also appears to be true of highly skilled labor. India is perhaps unchallenged among developing countries in the quality of its higher education. Numerous world-class scientists, mathematicians, and social scientists were educated in India, and Indian universities have great reputations. Nevertheless, wage levels in India for people possessing such advanced skills appear to be dramatically below those of other countries. One interviewee stated that computer programmers in India earn one-twelth of the salary of their counterparts in developed countries. One expected result of such differentials would be emigration of highly trained workers. This appears to be happening. Another intervieweeþa graduate of one of the country's most prestigious engineering schoolsþasserted that about 160 of the 185 students in

his graduating class are now working abroad, mainly in the United States.

Second, capital is misallocated. In India, capital is treated as a scarce commodity in some regards, yet it is massively underutilized. Measures aimed at conserving capital, for example, by controls on investment to prevent low utilization of the capital stock, result in the opposite phenomenon. Companies accumulate excessive capital as a defense mechanism to prevent competition. And the lack of competition reduces the pressure to use capital efficiently. Government ownership of the largest industries reinforces the underutilization, since decision-making takes on a political dimension and the government uses resources less efficiently than private firms in the same sectors (Nayar 1990). Highly capital-intensive industries, such as electrical companies, allow production to lag behind demand because of the slowness of the Government to carry out investment projects. This leads to defensive investment by firms providing backup generating capacity, which sit idle most of the time. Thus, the most capital-intensive industry is rendered more so by inefficiency.

The information collected for this study demonstrates two apparently contradictory things. First, there are a number of companies experiencing, and expecting to experience, rapid growth in exports. Yet, the overall export performance of the country is much less dynamic, even in some of the high-technology sectors where many of the firms operate.

The underlying facts regarding India clearly show that the economy is excessively isolated from world markets. This isolation relates to both price barriers (high import tariffs, overvalued exchange rate) and a variety of nonprice barriers (quantitative restrictions, licensing requirements, investment limitations, procedural controls). If economic theory has any validity, it must be concluded that these barriers limit both Indian exports and the economic welfare of the Indian population. Thus, the rationale for seeking greater openness in the Indian policy environment is quite strong. The proper question is how best to seek this desirable goal. The most direct approach, of course, is to seek a major decontrol of the economy by the Government. This approach has been central to the dialogue between the Government of India and its major donor (the International Bank for Reconstruction and Development (IBRD), which typically provides $2 billion per year in foreign loans) over the last decade or so. This has succeeded only in a limited fashion.

Extent to Which Intervention in the Market is Warranted

Economists frequently see the benefits of sound economic policies as self-evident and attribute departures from these principles as purely the result of evil forces, usually vested interests or rent seekers. In real-world practice, this is an overstatement. A more correct view is that the broad outlines of government policy were put into place because of the ideas of economists. Both the import-substitution era in Latin America (Kruegar 1991) and the Planning Era in India would seem to fall into this category. In both cases, ideas of "advanced" economists were implemented in a rational fashion. Once a broad framework is in place, the vested interests become a problem. They are less responsible for mistaken ideas than for the perpetuation of such ideas once they are in place.

The explanation for this resistance to change is understandableþparticularly for politicians, who are influenced much more by what they see than by theoretical constructs, particularly when such constructs are the products of long chains of deductive reasoning. The economist may say, "Eliminate import licensing and all good things will happen," but the politician who follows this advice is likely to be presented with a large number of bad things happening and (at least initially) may not see any good ones. The economist may argue that the closure of the factory that previously produced at twice the world price is a good thing, because it eliminates monopoly profits and capital misallocation. But it looks different to the politician when the factory's workers become unemployed.

Thus, it is much easier in concept than in practice to separate policy from project. An aid project may indeed have been unnecessary if the policy framework were correctþand therefore simply a substitute for reform. But it can also be a beacon that gives policymakers a glimpse of the reality behind the economist's theories. It provides a visual picture of the potential for real development impact from appropriate policies.

There has been no shortage of sound policy advice for India from donors. A.I.D. emphasized elimination of policy barriers to faster growth in the 1960s, and the World Bank has been pressing India on these issues for the last two decadesþall with little apparent effect. The PACT project appears to have supplemented such work by providing concrete examples of the potential benefits of better policyþa picture that may be worth a thousand words.

6. LESSONS LEARNED AND PROGRAM IMPLICATIONS

There are four basic trade and investment lessons for A.I.D. that can be drawn from the India study and a fifth for A.I.D.'s approach in India.

1. Project interventions can have significant policy fallout when they demonstrate the benefits of better policy and illuminate directions in which policy should move. The PACT project not only demonstrated a real capacity for indigenous R&D in India but also showed how the linkage to foreign firms was an essential ingredient to this indigenization. This was perhaps able to show the flaws in previous mindsetsþthe misperception that real technology development required independence from foreign firmsþand showed that linkage to the international- technology development milieu was essential, rather than harmful, to national R&D.

2. The basic findings of Keesing and othersþthat government export promotion activities are of limited or marginal valueþis strongly confirmed (Keesing and Singer 1992). It appears to matter much more how effectively intervention addresses key constraints facing exporters than whether institutions to support exporters exist. It is possible to spend large amounts of resources, as India does, without significant impact.

3. At least in the Indian context, there appears to be a significant rationale for intervention based on the firm's misperception of the risks and rewards of exporting. Firms in a protected environment are insufficiently aware of the potential for sharp increases in productivity from better technology and methods and of the increased profits that can be generated by such increases.

4. The highest payoffs come from close collaboration between foreign and domestic firms. The rewards of collaboration should not be seen as primarily of a one-time nature, but rather as an evolutionary process where continual contact moves firms step by step toward methods, technology, and products that are competitive on world markets.

A fifth lesson from the study relates to U.S. assistance policy toward India. It should be clear that the fundamental and overriding economic development problem in India is the massive waste of the country's scarce investment resources. Given its capacity to save, India should be growing at 9 to 10 percent per year. The massive underutilization of India's existing capital stock suggests that this is a vast resource available to increase incomes now, even

without additional investment. Thus, the payoff to policies that increase the efficiency of capital in the country should be large and immediate. The challenge is to identify paths of economic liberalization that will maximize this payoff while minimizing the adjustment costs that could interfere with political feasibility.

Continued liberalization of the trading regime and of the obstacles to domestic competition are the key vehicles by which this can be accomplished. While A.I.D.'s role as a marginal donor in India limits its ability to contribute to policy liberalization, such liberalization is so central to the economic welfare of India's population that it warrants concentration of A.I.D.'s limited resources on vehicles that show promise of pushing Indian Government policy in the proper direction.

FOOTNOTES:

1. This issue, including a discussion of the efforts of these technocrats to influence government policy over the past decade, is described in more detail in Appendix A.
2. The Government uses exchange controls extensively, and the price of dollars in the active black market was typically 20 percent higher than the official exchange rate. The Government also charged a 20 percent tax on first-class hotel bills settled in rupees rather than foreign exchange.
3. Because the 200 to 250 percent cap on repayments to PACT by grantees is in current rupees, a longer lag between grant and reflow will sharply reduce the value of the reflows in real terms. India's recent inflation has been in the 12 to 15 percent annual range. The low financial rate of return to the project is thus the result of the contractual terms of the subgrants, but it is consistent with a high economic rate of return to the project.

APPENDIX A

ECONOMIC POLICY BY EXAMPLE: THE CASE OF ELECTRONICS

Although the correctness of economic policy prescriptions may be evident to economists, it is seldom so to the rest of the population. There are two reasons for this. First, the general public cannot distinguish between mainstream economists and masquerading noneconomists. This is true even in the United States, where many opinion leaders on economic

policy issues represent ideological positions that do not satisfactorily reflect what economists know. Second, policymakers often view economists in general as technicians whose predictions (1) are not very reliable and (2) are often inconsistent with political realities.

Both factors have surely been important in India over the past several decades. Although the Kaldor and Mahalanobis based planning model may have been a feasible approach in the early 1950s, the miscalculation should have been evident to all careful observers by the early 1970s, when other Asian countries had begun to grow rapidly, while India suffered under its oppressive bureaucracy. Many extremely able Indian economists had made the correct diagnosis, but their voices were drowned in the cacophony of voices. Political leaders probably were not sufficiently convinced of the validity of the message to adopt a major policy reversal.

The Agency for International Development (A.I.D.) sought during the early 1970s to influence government policy by funding a series of economic studies. These included studies of the export possibilities for a large number of sectors of the economy as well as broad analytical work to demonstrate the possibility of substantially increasing Indian economic growth and exports through appropriate policy changes. A.I.D. also helped fund a major intercountry study of trade liberalization during this period by the National Bureau of Economic Research that included a study of a modest trade liberalization in India. The study concluded that trade liberalization would significantly increase Indian economic growth, and the intercountry work strongly reinforced this conclusion. But despite this analytical work, Indian economic policy turned further inward during this period, probably as a result of internal political dynamics.

The generation of studies of the importance of trade liberalization in the 1970s, along with considerable subsequent work by the World Bank and others, may have helped establish the climate during the early 1990s. There is no way of tracing the effects of such work on eventual policy outcomes.

Nevertheless, economic studies and policy dialogue are not the only factors to influence policy. A significant part of the successful change in India's opinion climate regarding economic policy may be due to the success of a small group of Indian bureaucrats in finding noneconomic justification for sound policy.

The accession to power of Rajiv Gandhi in 1984 did not herald a major change in economic policy, but

Gandhi did try to implement a new science and technology policy aimed at moving India toward the forefront in high-technology industriesþincluding computers and telecommunications. This policy was politically popular and justified on national security grounds. It was also a wedge that could be used to demonstrate that more liberal policies were beneficialþor even that such policies were essential.

The groundwork for Indian trade liberalization in computers and related sectors had been laid in the early 1980s. This involved discussions on technology policy between Prime Minister Indira Gandhi and people from the Department of Electronics and, among other things, included teaching Rajiv Gandhi, who had not yet entered politics, how to use a personal computer in 1982. This was reportedly accompanied by discussions of Indian comparative advantage in computer technology and the relative backwardness of the industry inside India. Ethnic Indians in the United States have been prominent in the development of computer software, developing Lotus 123 and producing software that reputedly had generated sales of $15 billion. One study (Brunner 1991) concluded that India was 3 years behind the United States in computer technology in the early 1980s because of the restrictions on access to foreign equipment and software.

The first significant action was the announcement of a new computer policy in November 1984. In any country other than India, the new policy would have seemed highly restrictive. It contains numerous prohibitions; requirements for administrative approvals for a wide variety of computer, component, and software imports; and numerous procedural limits on manufacture and sale. In the Indian context, however, it was a major liberalization, since some components and software imports were permitted without licenses (though with high dutiesþ60 percent for software and most components, 25 percent for others), and restrictions on manufacturing capacity were lifted for smaller companies.

The next step was taken in December 1986, when import prohibitions and license requirements for virtually all computer software were eliminated, and numerous other restrictive facets of the policy regime were simplified. In particular, software exporting firms were permitted to retain 30 percent of their export earnings for distribution and other expenses. Despite this liberalization, the overall policy and regulatory regime still made exporting extremely difficult. Nevertheless, the Indian comparative advantage is so strong in this area that the limited liberalization produced spectacular results.

The overall impact of the policy changes on the Indian computer industry is documented in Brunner (1991). He shows that Indian technology lagged 6 to 7 years behind the United States in the mid-1970s and that the gap had shrunk to 2 years by the end of 1986, when his analysis ends. The gap appears to have shrunk further since then. Opening up the industry led to difficulties for many Indian companies, but, overall, resulted in dynamic expansion of the sector. Indian data (which apparently includes significant sales in the noncompetitive Soviet Bloc market) shows computer hardware and software sales rising from $55 million in 1985 to $343 million in 1990. According to the data, software exports grew at a steady rate of about 40 percent throughout the period, while hardware sales only took off in 1988, when they tripled, followed by 40 percent growth in 1989 and 1990. These growth rates are far higher than for manufacturing generally. Software companies interviewed typically expressed confidence of continued 40 percent or 50 percent annual growth into the future.

The success of this sector has put a particular strain on the regulatory regime, because restraints are so easy to avoid. Software exports cannot be controlled or even monitored, because their essential feature is in electronic arrangements. Valuation of software exports is difficult, and an original program worth a few hundred dollars could be worth millions if reproduced abroad in multiple copies. Moreover, computer companies have steadily and successfully pressured the Government for simplification of import procedures, since speed is essential in such a rapidly evolving industry. {Footnote 4}

The same group of reformers that managed the software liberalization is now managing the National Informatic Centre, a unit of the Government of India Planning Commission. The unit is constructing a satellite-based national information system, which now has some 450 public booths, of which 8,000 are to be in place by 1993. A.I.D. is providing funding for some international data bases þand the World Bank is financing the expansion of the systemþas well as for establishment of private value-added vendors. These vendors will act as intermediaries between the public system and specialized formulations for companies that prefer not to access the system directly. The designers hope that India will quickly become a major exporter of data bases and value-added services.

The potentially largest consequence of the National Informatic Center is its almost incidental destruction of the monopoly power of the Indian telephone parastatal over data transmissions. A direct assault on the telephone monopoly, or an effort to

privatize communications probably would have failed utterly in the Indian environment. The national telephone company is widely alleged, including by several companies interviewed, to have retarded Indian export capabilities through its unresponsiveness and monopoly pricing of satellite-based communications. Yet this monopoly is disappearing almost without public debate, because of the political visibility and apparent desirability of the national information system. As in the software sector, the ultimate consequence of this system is likely to be further liberalization of the regulatory environment, simply because controls have become both absurd and unenforceable.

This story, although tantalizing, does not seem likely to yield general principles for policy reform. In all countries at all times, there is likely to be fierce competition for the ear of the leaders and their retinue. Often, this leads to the pursuit of absurd ideas, such as Lysenko's about agriculture under Stalinist Russia or Argentine's pursuit of atomic power in the 1960s. Nevertheless, it does suggest that economists might think more broadly and creatively. Economists' models are never likely to provoke the imagination of political leaders, although imagination is an essential element of political leadership.

Footnote:

4. For a discussion of the complexities of the 1986 policy, the enormous complexity of Indian Government controls, and the unavoidable inference that such controls cannot be maintained over the long run, see "The New Software Policy: Dr. Seshagiri Clarifies," Dataquest (India) January 1987, pp. 82-95.

APPENDIX B

PAPERS PREPARED FOR THE EXPORT AND INVESTMENT PROMOTION SERVICES ASSESSMENT

Benedict, Peter, Joe Ryan, and Charles Bell. 1993. Export Promotion in Indonesia. A.I.D. Technical Report No. 6. Washington, D.C.: A.I.D.

Fox, James. Export Promotion and Investment in India. A.I.D. Technical Report No. 16. Washington, D.C.: A.I.D.

Louis Berger International. 1990. Promoting Trade

and Investment in Constrained Environments: A.I.D. Experience in Latin America and the Caribbean. Two Volumes. A.I.D. Special Study Report No. 69 (Volume 1) Washington, D.C.: A.I.D. (Volume II is available from the A.I.D. library as A.I.D. Working Paper No. 134).

McKean, Cressida, Kiert Toh, and William Fisher. "Export and Investment Promotion in Thailand." A.I.D. Technical Report. Washington, D.C.: A.I.D. Forthcoming

McKean, Cressida, and James Fox."Export and Investment Promotion Services: Do They Make a Difference?" A.I.D. Program and Operations Assessment Report. Washington, D.C.: A.I.D. Forthcoming

Bremer, Jennifer, and Charles Bell. 1993. "Measuring Costs and Benefits of Export Promotion Projects: Findings from A.I.D. Experience." A.I.D. Technical Report No.14. Washington, D.C.: A.I.D. Forthcoming.

Bremer, Jennifer, and Charles Bell. 1993. "Service Use and Its Impact on Export Performance: Results of the Asia Surveys." A.I.D. Technical Report. Washington, D.C.: A.I.D. Forthcoming

Nathan Associates and Louis Berger International. 1992. Export and Investment Promotion: Sustainability and Effective Service Delivery: Synthesis of Findings From Latin America and the Caribbean. A.I.D. Program and Operations Assessment Report No. 1. Washington, D.C.: A.I.D.

Rock, Michael. 1993. Can Export Services Assistance Make a Difference?: The Korean Experience. A.I.D. Technical Report No. 7. Washington, D.C.: A.I.D.

Wichterman, Dana. "A.I.D. Export Promotion Projects in Egypt and Morocco: Conclusions From Project Evaluations." A.I.D. Technical Report. Washington, D.C.: A.I.D. Forthcoming

BIBLIOGRAPHY

Ahluwalia, I.L. 1985. Industrial Growth in India. New Delhi: Oxford University Press.

Akerlof, George. 1991. "Procrastination and Obedience." Washington, D.C.: Institute for Policy Reform.

Asian Development Bank. 1990. "India." In Asian Development Outlook 1990. pp. 135-142.

Bhagwati, Jagdish, and T.N. Srinivasan. 1975. Foreign Trade Regimes and Economic Development: India. New York: National Bureau of Economic Research.

Brunner, Hans-Peter. 1991. "Building Technological Capacity: A Case Study of the Computer Industry in India, 1975-87." World Development 19(12): 1737-1751.

Echeverri-Gent, John. 1990. "Economic Reform in India: A Long and Winding Road." In Economic Reform in Three Giants. Edited by Richard Feinberg. Delhi: Overseas Development Council.

Government of India, Ministry of Finance. 1991. Economic Survey 1990-91. Delhi: Government of India Press.

Kapoor, A., C. Michalopoulos, and J. Ulinski. 1971. [Untitled] Assessment of the USAID/India Export Promotion Program, pp. 45. January. Mimeograph.

Keesing, Donald, and Andrew Singer. 1992. Development Assistance Gone Wrong: Why Support Services Have Failed to Expand Exports. World Bank Working Paper No. 543. Washington, D.C: World Bank.

Krueger, Anne O. 1991. Ideas Underlying Economic Policy in the 1950s. Washington, D.C.: Institute for Policy Reform.

Kumar, Nagesh. 1991. "Mode of Rivalry and Comparative Behavior of Multinational and Local Enterprises: The Case of Manufacturing." Journal of Development Economics. 35: 381-392.

Lal, Deepak. 1988. India. Country Study No. 5. San Francisco, California: International Center for Economic Growth.

Lucas, Robert E.B., and Gustav F. Papanek. 1988. The Indian Economy: Recent Development and Future Prospects. Delhi: Oxford University Press.

Nabhi Publications. 1991. Exporter's Manual (17th Edition). Delhi: Sarla Devi Jain Press.

Bremer, Jennifer, and Charles Bell 1993. "Measurement Costs and Benefits of Export Promotion Projects: Findings from A.I.D. Experience." Washington, D.C.: Agency for International Development. (forthcoming.)

Nayar, Baldev Raj. 1990. "Property Rights Theory and Governmental Efficiency: The Evidence from India's Public Sector." Development Policy Review. 9: 131-150.

Pelay, Carlos. 1992. "Promotional Services Market ImpactþIndia." India Background Paper No. 1. Washington, D.C.: Agency for International Development

USAID/India. 1985. "Program for the Advancement of Commercial Technology Project Paper." Project No. 386-0496. Washington, D.C.: Agency for International Development. August.

Wiemann, Jurgen. 1988. India: Self-Imposed Restraint of Development Potential. Berlin: German Development Institute.

World Bank. 1990. India: Trends, Issues and Options. Report No. 8360-IN. Washington, D.C.: World Bank.